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and L. Bastien, with the aid of his tables of logarithms to 32 places of decimals found[1]

$$e^{\pi} = 23.1406926327792690057290863679,$$

$$e^{\pi/2} = 4.81047738096535165547303566 67,$$

$$\pi^{e} = 22.4591577183610454734271522045.$$

The symbol i for $\sqrt{-1}$ was first used by Euler in a "M.S. Academiæ exhibit. die 5 Maii 1777"[2] printed posthumously in 1794.[3] This notation was adopted by Gauss in 1801.[4]

The symbol π for the ratio of the circumference of a circle to its diameter was first used by W. Jones in 1706.[5] It was probably suggested to Jones by Oughtred who employed the symbol in a different sense.[6] Euler's first use of the symbol was in 1737[7]; up to that time he had used the letter p.

The symbol e for the number, defined by the series $1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} \cdots$, was first used by Euler in 1731.[8]

AMONG MY AUTOGRAPHS.

By DAVID EUGENE SMITH, Columbia University.

2. Dupin as Secretary of the Ionian Academy.

Among the most interesting but by no means most scholarly of the French mathematicians of the first part of the nineteenth century was that mélange of economist, politician, geometrician, and popularizer of science, Pierre-Charles-François Dupin (1784–1873). To the mathematician he is chiefly known as the favorite pupil of Monge and as his biographer; for his *Développement de géométrie*

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[1] *L'Intermediaire des Mathematiciens*, vol. 27, p. 65, May–June (not published till October), 1920. In the value for π^e given above the number "1" has been inserted in the seventh place from the end where "r" appears in the original.

[2] L. Euler, "De formulis differentialibus angularibus maxime irrationalibus, quas tamen per logarithmos et arcus circulares integrare licet."

[3] L. Euler, *Institutiones calculi integralis*, vol. 4, 1794, pp. 183–184. The symbol i is introduced on p. 184.

[4] C. F. Gauss, *Disquisitiones arithmeticae*, 1801, p. 337; *Werke*, vol. 1, 1870, p. 414.

[5] W. Jones, *Synopsis Palmiorum Matheseos*, London, 1706, p. 263.

[6] William Oughtred (1574–1660) in his *Clavis Mathematica* of 1647, etc., and in his *Theorematum in libris Archimedes de Sphaera et Cylindro Declaratio*, Oxford, 1652, frequently employs the symbol $\delta : \pi$ or $\pi : \delta$ (in modern notation) for the ratio of the semi-diameter to the semi-periphery or of semi-periphery to semi-diameter. It is noticeable that these letters are *never* used separately, that is, π is *not* used for "Semiperipheria," as Tropfke suggests (*Geschichte der Elementar-Mathematik*, vol. 2, 1903, p. 135). Oughtred states specifically in his "Theorematum": "$\frac{\pi}{\delta}R$, est semiperipheria circuli cujus Radius est R." In 1697 David Gregory used (*Philosophical Transactions*, vol. 19, p. 652) π/ρ to designate the ratio of the circumference to the diameter.

[7] L. Euler, "Variae observationes circa series infinitas," *Comment. acad. sc. Petrop.*, vol. 9 (1737), 1744, p. 165.

[8] *Corresp. math. et phys* . . . par Fuss, vol. 1, 1843, p. 58: "e denotat hic numerum, cujus logarithmus hyperbolicus est = 1."

(Paris, 1813); and for his contributions to the theory of curvature of surfaces, and the theory of light, the study of mechanics, curves of the third and fifth orders, and conjugate tangents. After having made a high record at the École polytechnique he entered the navy. His appointment to study the naval establishment of Great Britain led to the publication of his *Voyages dans la Grande-Bretagne* (Paris, 6 vols., 1820–1824). In 1819 he became professor of mechanics at the Conservatoire des Arts et Métiers, in 1824 he was created a baron by Louis XVIII, in 1837 he was made a peer, and in 1840 he became grand officer of the Legion of Honor. In the popular brilliancy of his career he showed much of the ability of his mother. It was largely she who directed the education of her three sons, all of whom became men of prominence, and it speaks well for her appreciation of their talents that she had placed upon her tomb the words, "Ci-gît la mère des trois Dupin." It was with reference to this inscription that Charles, who survived his brothers, was called in later life "the last of the Dupins."

Of the several letters of Dupin now in my collection perhaps the one that shows most clearly the great diversity of his interests relates to an incident in his life not generally known to those who study his contributions to geometry.

The letter to which I refer calls attention to quite a different line of interest and shows Dupin at the age of twenty-five in a capacity quite foreign to his mathematical interests. It reads as follows:

CORCYRE (CORFU), September 26, 1809; the 647th
Olympiad, 2d year.
ACADEMY.

Μετὰ Θάνατον ἀνίϛαται

Ch. Dupin, Secretary of the Ionian Academy for the French language and the official correspondence, Engineer in the French Navy,

To Monsieur De Gérando, Member of the Consulta charged with organizing the Roman states, and Secretary of the National Institute of France, 3d Classe.

Sir: I have the honor of laying the program of the Prix Olympiadiques before the Secretary of the Institute, in the Classe which has antiquity for the special subject of its meditations. Nothing which relates to Greece can be foreign to you.

We present to you our homage . . . . You belong to the Consulta, created for the regeneration of Rome and Latium. We believe that we see in you the representative of the sciences and arts of France, sent to modern Rome for the purpose of repaying with interest the benefits which Europe received from ancient Rome.

Finally, Sir, it is pleasing to me that, as the representative of a learned society, I am allowed to pay my respects to an old friend of my father's (Dupin, de la Nièvre, ex-legislator, Rue du bacy, No. 998).

I earnestly hope that the program of our prizes may be so fortunate as to command your approval, and I could wish nothing more than that you would accede to the request which I have the honor to make.

Permit us to add a notable name to the list of associates who honor us, and among whom we are able to name Monti, Fabroni, Chaptal, and many other members of the Institute of France.

How great would be my happiness if I could be able to present to the Ionian Academy a present such as that of your fellowship in this institution, young and still feeble, but which recalls at least some of the glorious ideas of ancient Greece.

I have the honor, Sir, of saluting you with the highest consideration.

CH. DUPIN.

The letter thus presents a single interesting incident in a very interesting life,—a life that was probably more extended than that of the Academy which he was influential in establishing.

3. PICARD[1] AND CASSINI.

Scientific letters more than two hundred years old are becoming rare.. They exist in the museums and great libraries, particularly in Europe, but every year it is becoming more difficult to secure them for private collections. One of the most valuable, of those which I have, came into my possession recently, and is of particular interest because of the men concerned and because it contains the results of certain important astronomical observations. The letter was written at Brest on October 2, 1679, by Jean Picard, and is addressed to "Monsieur Cassini, a l'observatoire Royal au faus-bourg St. Jaques. A Paris." Picard was then fifty-nine years of age, and this letter was written about three years before his death. His life had, as is well known, been actively devoted to scientific work. He was born in 1620 and became the foremost astronomer of his time, greatly improving the instruments of observation, making a very satisfactory measurement of a degree of a meridian (1669), and writing on the form of the earth. It was his measurements which enabled Newton to confirm his theory with respect to gravitation.

The Cassini to whom the letter was written was Giovanni Domenico (Jean-Dominique). He was for a time professor of astronomy at Bologna, but in 1669 the pope agreed to his acceptance of a call to Paris, where he became the first of four generations to fill the post of director of the great French observatory. He determined the motion of Jupiter's satellites, discovered four of Saturn's, made a close approximation to the parallax of the sun, corrected Kepler's value of the earth's eccentricity, and first described the ovals that bear his name.

It was very likely in connection with Cassini's observations on the satellites of Saturn that Picard, wishing to assist him, wrote the following letter:

> "I have already written you that, on the twenty-fourth, at 16 H. 15′ 56″ we observed the immersion of the first satellite in the shadow; this observation, which was very favorable, gives a difference of 27′ 33″ in comparison with the one that you made on the night of the twenty-sixth . . . I also made this last observation, but did not consider it valuable because of the humidity at that time. . . . We were more fortunate on the evening of the twenty-ninth, when the immersion of the second satellite took place at precisely 10 H. 16′ 47″. . . . We expect to leave on Tuesday, Oct. 4, or at the latest on Thursday, wishing to observe once more the immersion of the first satellite which takes place the night of the 3–4th.

The letter then proceeds to discuss more personal matters, relating in part to asking Cassini to write to "Mr. l'Abbé" about their departure. This M. l'Abbé was evidently an older scientist, for Picard remarks that he had been "pretending to make some dissections of fish, but an old man like him ought to be content with dissecting sardines,"—which shows that the greatest savants have their sense of humor.

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[1] See the article in *Revue générale des Sciences* referred to on page 137 of this issue of the MONTHLY.—EDITOR.